

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 February 2004 (19.02.2004)

PCT

(10) International Publication Number
WO 2004/014320 A3

(51) International Patent Classification⁷: **A01N 43/04**,
A61K 31/715, C07H 1/00

(21) International Application Number:
PCT/US2003/025237

(22) International Filing Date: 13 August 2003 (13.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/403,424 13 August 2002 (13.08.2002) US

(71) Applicants (*for all designated States except US*):
BIOPOLYMER ENGINEERING, INC. [US/US]; 3388
Mike Collins Drive, Eagan, MN 55121 (US). **UNIVER-**
SITY OF LOUISVILLE RESEARCH FOUNDATION
INC. [US/US]; 2301 S. Third Street, Louisville, KY 40208
(US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **OSTROFF, Gary,**
R. [US/US]; 301 Bridle Path, Worcester, MA 01604
(US). **ROSS, Gordon, D.** [US/US]; 11739 Paramount Way,
Prospect, KY 40059 (US).

(74) Agents: **CARROLL, Alice, O.** et al.; Hamilton, Brook,
Smith & Reynolds, P.C., 530 Virginia Road, P.O. Box 9133,
Concord, MA 01742-9133 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,
MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC,
SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
2 September 2004

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: METHODS OF USING BETA GLUCAN AS A RADIOPROTECTIVE AGENT

(57) Abstract: The invention relates to methods for treating and preventing radiation and/or chemotherapy related injury and/or afflictions, such as myelosuppression and decreased macrophage activity, by administering a prophylactically or therapeutically effective amount of particulate, bioavailable $\beta(1,3; 1,6)$ glucan. The invention also relates to methods in which $\beta(1,3; 1,6)$ glucan is provided in the form of whole glucan particles, microparticulate β -glucan particles or a combination thereof.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25237

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A01N 43/04; A61K 31/715; C07H 1/00

US CL : 514/54; 536/123.1, 123.12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 514/54; 536/123.1, 123.12

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST, REGISTRY, CAPLUS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,504,079 A (JAMAS et al.) 02 April, 1996 (02.04.1996), whole document, especially column 2, lines 40-68).	1-15 and 17-19
Y	US 4,818,752 A (WILLIAMS et al.) 04 April 1989 (04.04.1989), whole document.	1-15 and 17-19
Y	US 5,783,569 A (JAMAS et al.) 21 July 1998 (21.07.1998), whole document, especially column 7, lines 42-67.	1-15 and 17-19



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

07 November 2003 (07.11.2003)

Date of mailing of the international search report

08 JUL 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

James O. Wilson

Telephone No. 703-308-0196

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25237

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claim Nos.: 16
because they relate to subject matter not required to be searched by this Authority, namely:
Please See Continuation Sheet
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such
an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all
searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite
payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report
covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is
restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐

The additional search fees were accompanied by the applicant's protest.

☐

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US03/25237

Box I Observations where certain claims were found unsearchable 1. because they relate to subject matter not required to be searched by this Authority, namely:

Claim 16 is unsearchable because th claim is drawn to the "use of the glucan" wherein the "use" does not set forth any steps involved in the process, thus resulting in an improper definition of a process, i.e., results in a claim which is not a proper process claim.